Mites on Poultry

IRWIN H. ROBERTS AND C. L. SMITH

MITES on fowl are sometimes mistaken for lice. Actually they are quite different.

Parasitic mites are so small that they are barely visible to the naked eye. All mites have four pairs of legs in their adult stage. Lice have three pairs of legs. Some of the mites are bloodsuckers. They may live for a long time without food. They and lice are controlled by different methods.

Two groups of mites attack poultry. One spends the greater part of its life cycle in crevices about the poultry houses, from which it makes nightly forages upon the roosting birds to suck their blood. The second group spends the entire life cycle on the birds; they burrow into the skin, into the shafts of the feathers, beneath the scales of the legs, and into the internal organs.

Of the several kinds of mites that may infest poultry anywhere in the United States, the commonest and perhaps the most injurious is the chicken mite (Dermanyssus gallinae). It is also known as the red chicken mite or the roost mite. The adult is not more than one thirty-second inch long when fully engorged with blood—about the

Lindane probably is the most effective. Lindane may be applied to the roosts with a small paintbrush or sprayed over the roosting surfaces, nesting boxes, and floor. To prepare a paint containing about 1 percent of lindane, you mix 5 ounces of lindane wettable powder containing 25-percent gamma isomer (or 6 ounces of 20-percent lindane emulsifiable concentrate) with a gallon of water. You apply the paint to the roosts with a small paintbrush to the point of runoff.

Spraying poultry houses is a little more effective than painting in that coverage of roosting surfaces is usually better. If many birds are involved, spraying is easier and takes less time. To prepare a spray containing about 0.5 percent of lindane, you add three-fourths pound of 25-percent lindane wettable powder (or 1 pint of 20-percent lindane emulsifiable concentrate) to each 5 gallons of water.

Malathion also is effective against lice when used at a 1-percent concentration as a roost treatment. Sprays should be applied liberally, to the point of runoff, on roosts and perches and, if desired, lightly to nesting boxes and floor. A small knapsack sprayer is suitable for all but large establishments. Five gallons of spray are enough to treat buildings housing 750 to 1,000 chickens.

IRWIN H. ROBERTS is a parasitologist in the Animal Disease and Parasite Research Branch. He was graduated from Alfred University and has the degree of doctor of veterinary medicine from Cornell University. He entered the former zoological Division of the Department of Agriculture in 1937, and since 1940 has been engaged in investigations of parasitic diseases.

C. L. SMITH is an entomologist in the Entomology Research Branch. He is a graduate of Mississippi State College and Louisiana State University. Since 1940 he has been project leader for research on the control of lice, mites, and fleas affecting livestock. In 1951 he became assistant station leader of the Department's laboratory at Kerrville, Tex.
size of the head of a pin. Chicken mites are gray when unfed and reddish after having had a blood meal. When many of them infest a poultry house, they can be found by lifting a clod of manure off the roosts. Joints in the roosts are often surrounded by tiny, salt-and-pepper specks, which are the excrement of the hidden mites. After taking a blood meal from the bird, the female chicken mite finds a crevice, usually on the roost, and deposits a few eggs. She then returns to the bird for additional meals. She may deposit 35 eggs in her lifetime. Larvae, which hatch from the eggs in 1 or 2 days, do not feed but shed their skins and then become nymphs. The nymphs attack the birds, suck blood, molt, suck blood a second time, molt again, and become adults. In warm weather or in heated buildings, the entire cycle may take only 1 week. Enormous infestations may build up in poultry houses in 3 or 4 weeks.

The northern fowl mite (Bohemyssus sylviarum), also called the feather mite, is distributed widely over the United States, but is encountered less frequently than the chicken mite. It looks like the chicken mite but has a different life history.

Northern fowl mites normally spend their entire lives on chickens or other birds, but they are sometimes found in birds' nests and can breed on or off the birds. Their entire life cycle lasts 8 to 12 days. They can be found on the birds during the day. They move rapidly. If infested birds are picked up, the mites crawl over the handler's arms and sometimes on his clothing. They usually congregate about the bird's vent and give the feathers a soiled appearance. Their voracious blood-sucking habits may irritate the skin severely. Heavy infestations may develop in a short time.

Another mite that lives continuously on chickens and other birds is the scaly-leg mite (Knemidokoptes mutans). It attacks the unfeathered parts of the legs, burrows into the skin, and causes a condition like mange of livestock. It is generally found on older birds in the flock. It is less prevalent than the chicken mite and the northern fowl mite.

Scaly-leg mites usually are first noticed between the toes. As they multiply they work their way up the leg. They cause the scales to separate from the skin and the feet and legs to swell and become deformed. Occasionally they may spread to the comb and wattles. Scaly-leg mites are too small to be seen with the naked eye, but the symptoms they produce are detected easily.

The practice of culling old birds has eliminated the scaly-leg mite to a large degree, and it is now rarely seen except in small farm flocks.

Closely related to the scaly-leg mite is the depluming (or body-mange) mite of chickens and other birds (Knemidokoptes laevis var. gallinae). It also passes its entire life on the bird. It burrows into the skin at the base of the feathers. It is found only on the feathered areas of the body, usually over the back and sides. The mites cause intense irritation, so that the fowl may pluck out or break off their feathers. You can see this tiny mite only with a lens or microscope.

Most of the mites parasitic on chickens also can live on turkeys and other fowl, but they do not trouble turkeys quite so much as they do chickens. Apparently the management practices used for turkeys are not conducive to the propagation of mites. The most common mite affecting turkeys is the chicken mite. The northern fowl mite occasionally is troublesome. Both may be controlled with the same measures used against mites on chickens.

Severe infestations of mites do more damage than lice do. Mites that burrow into the skin produce intense skin irritation and heavy formation of scabs. Such injury retards the birds and spoils their appearance when dressed. Some species cause the loss of feathers, thereby interfering with the regulation of body heat. The nests of laying hens sometimes have so many chicken mites
that the birds cannot remain in them.

Anemia, caused by the loss of blood, is common. Heavily parasitized fowl become thin, weak, and restless. Egg production falls. Young and laying birds may die. The injury due to mites that live in the internal organs has not been calculated, but may be sizable.

An indirect loss due to bloodsucking mites results from their ability to transmit disease, such as fowl cholera and Newcastle disease, among flocks.

For each of the four kinds of mites commonly found on chickens, a different method of attack is required. It is therefore essential to determine what species is present. If two or more species are present simultaneously, separate treatments will be necessary.

To control infestations of the chicken mite, an insecticide should be applied to the poultry house. It is not necessary to treat the birds. The first step is to clean the building, nesting boxes, floor, and dropping pits thoroughly; burn the litter; and dispose of manure. Dried manure should be scraped from roosts and perches.

This cleaning should be followed by a liberal application of 0.5-percent lindane or 2.5-percent DDT spray to the entire interior. Lindane or malathion applied to the roosts as a 1-percent paint is also satisfactory against the chicken mite. Lindane and malathion have a further advantage in that if the birds are returned to the buildings at the close of the day, all their lice will be destroyed.

With any of these insecticides, a second application may be required in 10 to 14 days, particularly in heavy infestations. It is not easy to eradicate chicken mites entirely.

Because the northern fowl mite remains on the birds most of the time, insecticidal dusts and dips applied directly to the birds are effective control measures.

Sulfur has been used for many years. The treatment of individual birds with powdered sulfur is satisfactory if liberal amounts of dust are used and if application is thorough. Dipping the birds in sulfur baths is laborious, but the results are gratifying. Dips may be prepared by mixing 2 ounces of finely ground sulfur (325 mesh) and 1 ounce of powdered soap or detergent to a gallon of lukewarm water. The feathers should be wet to the skin, and the head dunked. It is always advisable to dip fowl on warm, sunny days or in heated buildings. Treatment with either sulfur dusts or dips should be repeated as required.

An effective and quick treatment to eliminate northern fowl mites consists of applying to the roosts or litter a chemical, the vapors of which will destroy the mites on the birds. Undiluted nicotine sulfate (40 percent) may be applied with a brush to the roosts, perches, and other roosting surfaces, at the rate of 1 to 1.5 ounces for each 30 feet of roost. As nicotine sulfate volatilizes rapidly, it should be used shortly before roosting time. About three applications a week apart are required to end infestations. The buildings should be ventilated after nicotine sulfate is used.

Another easy and less hazardous way is to treat the litter with malathion. A 4-percent malathion dust applied to the litter only, 1 pound to 50 square feet of floor space, will control the northern fowl mite. The dust should be applied uniformly with a plunger or rotary hand duster or a shaker can or jar.

An old, simple, and effective treatment for the scaly-leg mite consists in dipping the feet and legs of infested birds in crude petroleum. Usually one treatment is enough, but a second treatment about a month later may be required in heavy infestations.

A mixture of 1 part of kerosene to 2 parts of raw linseed oil also may be used as a dip for the feet and legs. Repeated treatments every 2 to 4 weeks, until healing takes place, may be required with this mixture.

For controlling the depluming mite, old, established remedies continue to be effective. The birds may be dipped
in a bath containing 2 ounces of wet-
table sulfur per gallon of water. If spot
treatment on a few birds is all that
seems necessary, a sulfur ointment can
be rubbed into the affected areas of
the skin. The ointment can be pre-
pared by mixing 1 tablespoonful of
flowers of sulfur in one-half cup of
lard or vaseline.

**Diseases of Ducks**

E. DOUGHERTY III

DUCKS are waterfowl and scavengers
by nature and are relatively resistant
to many common diseases of birds.

The large, modern, commercial duck
ranch is a long step from nature, how-
ever. Confinement creates such prob-
lems as a damp, ammonia-laden at-
omosphere; rapid spread of some dis-
eases that are almost unknown in wild
ducks (paratyphoid, scrositis, and fowl
cholera); heavy insect populations;
and leg weakness.

On the other side of the ledger, con-
finement rearing (with a controlled
water supply) has all but eliminated
western duck sickness (botulism), para-
sitism, and attack from predatory ani-
mals, which are scourges of wild ducks.

The duck rancher has to provide an
escape for moisture to prevent ammo-
nia burn. To accomplish that he re-
places the litter daily or provides wire
floors over washable pits on at least
part of the building. Other problems,
such as botulism, have been solved by
the use of pelleted feed and a constant
water level.

Flies can be controlled by modern
chemicals. They must be checked be-
fore use, however, because some of the
thiophosphates, which are safe to use
in chicken houses, are highly toxic to
ducks.

**Paratyphoid**, or keel, is an infec-
tious disease of young ducklings (also
of turkeys and other birds). It is caused
chiefly by a bacterium, *Salmonella typhi-
murium*, and to a less extent by other
species of salmonellas. Mortality is
usually low (less than 10 percent) on
Long Island, but poor incubator and
brooder management increase the
death rate.

The name "keel," which stems from
early observations that the ducks sud-
denly keel over when dying, is mis-
leading. Often the ducklings become
dehydrated and emaciated and die
slowly. They may gasp for air or
tremble, as though chilled.

The common lesions are small, white
spots on the liver, cheesy plugs in the
blind gut, and a thickening of the wall
of the large gut.

The best preventive measure we
know of is to fumigate the eggs during
early incubation and the hatching unit
between hatches. Potassium permanga-
nate and formalin are recommended.

Potassium permanganate crystals
should be used at the rate of one-half
ounce (weighed) and 1 ounce of for-
malin (measured) to every 80 cubic
feet of incubator or hatcher space.
The potassium permanganate crystals
are placed in an earthenware vessel

**Yearbook of Agriculture 1956**

IRWIN H. ROBERTS, a parasitologist in
the Department of Agriculture, has studied
parasitic diseases of livestock in South-
western, Western, and North Central
States. He is stationed in Springfield, Ill.

C. L. SMITH in 1955 became project
leader at the Department's laboratory in
Orlando, Fla., in charge of methods and
procedures for eradicating the screwworm.